

KEWEENAW BAY INDIAN COMMUNITY

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December 20, 2012

Tinka Hyde
Director, Water Division
US EPA Region 5
WG-15J
77 W. Jackson Blvd.
Chicago, IL 60604-3590

Sent via U.S. mail and E-mail

Re: EPA's Review of MDEQ's Proposed Changes to Copper Water Quality Standards at Twelve Sites in the Upper Peninsula of Michigan

Dear Ms. Hyde,

The Keweenaw Bay Indian Community (Community), a federally-recognized tribal nation, submits the following attached comments related to EPA Region 5 Water Division's (EPA) federal action to approve the State of Michigan's proposed changes to copper water quality standards for parts of the Upper Peninsula, specifically the Keweenaw. The Community also extends its appreciation for the efforts of EPA Region 5 Water Division to engage us in consultation regarding this request by the State of Michigan.

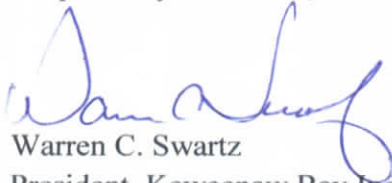
We are one of many tribes that have centuries of cultural and spiritual connections to the land, waters and fish in the streams and waterways of Lake Superior – *Anishinaabeg-Gitchigami*. Under the 1842 Treaty of LaPointe, our Community reserved rights to hunt, fish, trap, and gather on traditional homelands ceded to the United States. The proposed changes to water quality standards at each of the twelve sites proposed by the State of Michigan are located within this territory.

Copper mining operations from 1855-1968 deposited millions of tons of metal-rich tailings into rivers and waterways of the Keweenaw, and directly into Lake Superior. This has led to substantial adverse impacts, in some cases devastating, such as the Torch Lake Superfund Site. This has caused injury to traditionally used lands and waters, treaty protected tribal trust resources, and the habitats and ecosystems that support those resources.

The Community hereby submits the attached comments including our administrative, scientific and cultural concerns, and asks EPA to deny this request by Michigan. We further ask the agency to please consider these comments in light of the foundational goals and intent of the nation's Clean Water Act, federal trust responsibility and treaty obligations to our Community, binational principles within the Great Lakes Water Quality Agreement, and the Obama Administration's commitment to meaningful consultation with tribal nations and the advancement of environmental justice for tribes' and indigenous peoples.

Please feel free to contact our mining and water quality staff directly, Micah Petoskey, Charles Brumleve, or Jessica Koski, if you have any questions or need any additional information.

Respectfully submitted,



Warren C. Swartz

President, Keweenaw Bay Indian Community

cc: Candice Bauer, USEPA
Susan LaFernier, KBIC Secretary
Lori Ann Sherman, KBIC Natural Resources Director
Micah Petoskey, KBIC Water Quality Specialist
Charles Brumleve, KBIC Environmental Mining Specialist
Jessica Koski, KBIC Mining Technical Assistant

Keweenaw Bay Indian Community
Comments on EPA's Decision to Approve
Site Specific Copper Water Quality Standards by the State of Michigan at
Twelve Sites in the Upper Peninsula

The Keweenaw Bay Indian Community offers the following comments on Michigan's proposed changes to copper water quality standards at 12 sites in the Upper Peninsula, particularly the Keweenaw. Our comments are provided for Region 5 EPA who is providing oversight review of these proposed changes under Section 303 of the Clean Water Act.

Administrative Concerns

Tribal Consultation

EPA's Policy on Consultation and Coordination with Indian Tribes of May 4, 2011 states:

- *"Consultation is a process of meaningful communication and coordination between EPA and tribal officials prior to EPA taking actions or implementing decisions that may affect tribes."*
- *"Consultation should occur early enough to allow tribes the opportunity to provide meaningful input that can be considered prior to EPA deciding whether, how, or when to act on the matter under consideration."*
- *"To make consultation meaningful, both parties should commit to the consultation process with an open mind."*

EPA Region 5's Implementation Procedures for EPA Policy on Consultation and Coordination with Indian Tribes of July 26, 2011 states:

- *"EPA Region 5 will use its best efforts to invite a tribe or tribes to consult early enough in the process so that it has not narrowed significantly the possible outcomes."*
- *"EPA Region 5 will make every effort to alert tribes to upcoming public participation/comment periods, for federally approved, delegated, or authorized state programs..."*

While the Community appreciates the efforts EPA has taken thus far to invite tribal consultation on a government-to-government basis on the proposed changes to MI's water quality standards at the 12 sites, it has not been necessarily *meaningful* from the Community's perspective for the following reasons:

1. During a Tribal Consultation call on December 17, 2012 between KBIC and EPA, it was clear that in order for the Community's input to be more meaningfully considered, it should have been provided and addressed during the state's previous 30-day public comment period

before it came under EPA review. While it is noted and recognized that the ideal process is for tribal concerns and interests to be addressed and taken into account earlier during the state's public comment process, this may not always be the case and the Community has submitted comments to the state on numerous occasions and our concerns are often ignored. Will our current comments related to important water quality concerns in our traditional waters and homelands not be as meaningfully considered during the current federal review process in light of statutory deadlines and the assumption that any issues should have been resolved before coming to EPA for approval? If this is the case, it seems to be a violation of EPA's Tribal Consultation Policy of 2011.

2. The State does not possess the important historical federal trust responsibility to Indian Tribes as the federal government does which is expressed and recognized within treaties and federal Indian law. It is our expectation that the State, in accepting delegated responsibilities under the nation's Clean Water Act, also comply with federal standards and responsibilities for tribal consultation. The Community has had ongoing challenges toward achieving meaningful participation with the State of Michigan to ensure adequate protection of our water, cultural resources, wildlife and other shared natural resources in accordance to tribal traditional and subsistence uses. The Community will seek avenues at the State level to try to improve this process for earlier and more meaningful opportunity to provide tribal input, including participation in the beginning of processes of studying and developing site specific water quality standards. However, we ask the EPA to also seriously consider providing requirements in its guidance and agreement documents to states implementing federal environmental programs, particularly the State Michigan, to provide an opportunity for meaningful tribal consultation on decisions that affect us.
3. Neither the limited public comment period at the state or federal level allowed for a sufficient amount of time that is necessary for the Community to collect the acceptable specific documentation related to reserved treaty resource uses (plants, fish, wildlife) by tribal members throughout the 1842 Treaty territory that could be impacted by some of the site specific water quality changes. Moreover, the Community's position and authority as a sovereign entity should not only be relegated to public comment timeframes.

Anti-Degradation Policy and Goals

Under the Clean Water Act, the EPA was expected to adopt stricter standards, including zero discharge, to protect public health with an ample margin of safety. The fundamental goals of the Act are to "... *restore and maintain the chemical, physical and biological integrity of the Nation's waters*"¹ and the provision of 303(a) made water quality standards under prior law the "starting

¹ Clean Water Act Section 101(a).

point" for Clean Water Act water quality requirements. Anti-degradation is explicitly incorporated into the Clean Water Act under Section 303(d)(4)(B) and Section 118(c)(2). The EPA is also guided by the principles and approaches laid out in the revised Great Lakes Water Quality Agreement, which also embraces an anti-degradation policy to maintain or improve existing water quality in the waters of the Great Lakes.² The proposed site specific water quality will unnecessarily lower the water quality at some sites, and still fail to bring at least one site into compliance based on KBIC's water monitoring data.³ By approving Michigan's proposed changes, the agency may violate national and binational anti-degradation standards, and risk jeopardizing a reasonable margin of safety.

Methodology & Future Proposed Changes

Michigan's proposed site specific criteria were developed based upon calculations that failed to account for the most current research and literature available. As presented in Dr. Noel Urban comments (attached), the justification to change the required water quality standard is based on oversimplified assumptions and evaluations. Site specific criteria should consider Dr. Urban's comments, as well as synergetic effects and an ecosystem approach. In addition, it is concerning that the site specific criteria were generally applied to the twelve sites, in which only a couple of sites in fact overlap with the data.

We ask the EPA to consider a review of the current literature and additional ongoing research alongside the results of MDEQ's study. The impacts of changing copper standards could set a dangerous precedence for our waters and have implications within *and* beyond the twelve sites proposed by MDEQ. It is the Community's request that if this new standard is approved, any future changes to other water systems should require a separate study specific to those water systems using appropriate and scientifically sound methodology.

Scientific Questions

Limitations of the Calculations Used to Derive the Site-Specific Standards

As noted above, Dr. Urban, a professor of Environmental Engineering at Michigan Technological University, has provided some comments concerning the methodology used to develop the new proposed site specific water quality standards. These include an inadequate assumption that DOC is the only water quality characteristic of significance for adjusting the aquatic life values for copper in

² Great Lakes Water Quality Agreement, September 7, 2012, p. 9, *available at* http://www.epa.gov/glnpo/glwqa/20120907-Canada-USA_GLWQA_FINAL.pdf

³ Keweenaw Bay Indian Community Natural Resources Department, November 8, 2006 – August 2012 Water Monitoring Data for the East Sleeping River near the Ontonagon Reservation. The data shows that most of the samples have copper levels over the current limit and one of the samples would be over the proposed change.

streams and that the modification of aquatic life values would best be achieved by linear graphic correlations.

Additional comments raised by Dr. Urban relate to the questionable logic and justification for multiplying old, hardness based FCV by the site-specific WER, and a lack of analysis and account for uncertainty in order to ensure a margin of safety.

Oversimplified calculations fail to take into account the latest research and synergetic effects, such as the relationship between copper and mercury and its effects on aquatic life, or the relationship between copper, plant toxicity and stream cover effects on aquatic life. Furthermore, any calculations and approved water quality standards designed to protect aquatic life should also consider any potential disproportionate health implications through human consumption of the aquatic life supported by tribal harvest rights and values.

We ask the following questions:

- (1) If toxicity is unrelated to hardness, why is hardness part of the new formula?
- (2) Are there enough samples to demonstrate the lowest DOC in a water body?
- (3) The state only collected samples during summer months, yet if more complete seasonal data were collected, might lower DOC values be found?
- (4) Will there be a minimum DOC data set required before the proposed method is used?
- (5) If a site specific Cu standard is set based on DOC and results in a Cu limit that is lower than the limit set by traditional methods, does the discharger get to use the least restrictive method?

Biological, Ecosystem and Human Health Impacts of Copper

A recent study of the National Oceanic and Atmospheric Association found that the thresholds are extremely low for salmon, in that the copper affects behavior and makes them more susceptible to predators.⁴ This reasonably suggests the potential for similar predation risk associated with copper on aquatic life in the waters affected by the proposed water quality changes in Michigan.

It is widely known that aquatic plant life would be impacted by any increase in copper levels. Elevated copper levels are known to inhibit photosynthesis and plant growth. The proposed water quality changes fail to further take into account how the surrounding forest health would be affected through an increase in copper through the food web and bioaccumulation.

⁴ NOAA. 2009. "Impacts of copper on the sensory biology and behavior of salmon." *Available at* http://dec.alaska.gov/water/wqsar/wqs/pdfs/AFE_2_9_10_Collier.pdf.

According to the Minnesota Pollution Control Agency (MPCA), copper is also synergistic with other metals in affecting aquatic life. The MPCA has an acute toxicity additive standard to address this problem for discharges with more than one metal. Copper toxicity in water (and most of the metals) is also dependent on the hardness of the water. The lower the hardness (i.e., Ca + Mg), the lower the level of copper needed for a toxic dose. We recommend that proposed changes to Michigan copper criteria consider the applicability of hardness based Minnesota water quality standards for copper.⁵

While copper is a micronutrient for humans and toxicity is rare in the general population, acute copper poisoning can cause abdominal pain and nausea which prevent additional ingestion and absorption of copper, as well as more serious signs of severe liver damage, kidney failure, coma, and death.⁶ There is also a possibility of liver damage resulting from long-term exposure to lower doses of copper. In addition, individuals with genetic disorders affecting copper metabolism may be at greater risk for adverse effects of chronic copper toxicity at lower intake levels.

Relationship of Copper and Mercury

Emerging research conducted by Dr. Charles Kerfoot at Michigan Technological University shows a high correlation between increased copper levels and a loss of microbes that break down mercury in a given system.⁷

Mercury has long been known to be highly toxic and detrimental to aquatic life and humans. Most mercury exposure to humans occurs through fish consumption, as it is readily taken up by fish in waters containing mercury. The developing fetus of children are particularly sensitive to methylmercury's adverse neurological effects – in which even small amounts of exposure at this time can lead to irreversible neurological damage. A recent study by the Minnesota Department of Health measured mercury in infants born in the Lake Superior basin and found that 8% were above the EPA Reference Dose for methylmercury.⁸

⁵ Minnesota Administrative Rules Ch. 7050.0222 “Specific Water Quality Standards for Class 2 Waters of the State; Aquatic Life and Recreation.” (See Subparts 2, 3, and 7b). Available at <https://www.revisor.mn.gov/rules/?id=7050.0222>.

⁶ Linus Pauling Institute. 2003, updated 2007. Micronutrient Information Center: “Copper.” Oregon State University. Available at <http://lpi.oregonstate.edu/infocenter/minerals/copper/>.

⁷ Kerfoot, Charles. 2012. “A Rare Glimpse Into the Past: Lake Superior Sediments Reveal Long-Term Methyl Mercury Records from Mining.” Presentation of the Lake Superior Binational Forum. Available at <http://www.authorstream.com/Presentation/lakesuperiorstew-1559733-charles-kerfoot-audio/>.

⁸ Minnesota Department of Health. November 2011. Final Report: “Mercury Levels in Blood from Newborns in the Lake Superior Basin.” Available at <http://www.health.state.mn.us/divs/eh/hazardous/topics/studies/glnpo.pdf>.

Great Lakes Initiative (GLI) mercury standards for the Lake Superior watershed are more restrictive than statewide numbers. The GLI standards are not dependent on hardness and look at aquatic life toxicity, wildlife toxicity via fish consumption, and human health based on water and fish consumption – and select whichever is most protective. We recommend that EPA look at the recent research related to the relationship between copper and mercury before approving the proposed revised water quality standards in Michigan that have failed to take this research, and could have implications to aquatic life and human health contrary to Lake Superior ecosystem and zero-discharge goals for the release of chemicals, especially mercury.⁹

Cultural Concerns

“Political technologies, including the calculative techniques such as the enumeration of contamination levels – are considered a form of ecocolonisation that have considerable political effects on Indigenous communities.”¹⁰

In addition to the Community’s scientific concerns, the cultural requirements for “aquatic life designated uses” go beyond what may have been considered by the State’s proposed water quality standards. Our definition of the aquatic life designated use includes human consumption, particularly to support traditional cultural and subsistence uses now and into the future on our traditionally used lands and waters.

In 1842, the Ojibwa, including the Keweenaw Bay band, retained rights to ensure subsistence food sources for survival and cultural sustenance – by reserving hunting, fishing and gathering rights in a treaty signed with the United States. Any unnecessary lowering and less protective water quality policies greatly concern the Community and increase pressure on a margin of safety threshold for our health, environment, and the habitats and ecosystems that support tribal trust resources.

Considering recent research by Dr. Charles Kerfoot regarding the relationship between increased Cu levels and increased mercury levels, many American Indian tribes and their members are also among the most disproportionately burdened by mercury contamination, which is highly correlated to copper levels in the Upper Peninsula. A study entitled “Environmental Justice in a Tribal Context: A Madness to EPA’s Method” by Catherine O’Neill shows that fish consumption in native communities is 4 to 13 times higher than the national average used in developing these

⁹ Lake Superior Binational Program. 2012. “Lake Superior Lakewide Management Plan: 1990-2010, Critical Chemical Reduction Milestones, October 23, 2012.” Available at <http://www.epa.gov/greatlakes/lakesuperior/2010/2010-lamp.pdf>.

¹⁰ Norman, Emma S, PhD. “Who’s Counting? Spatial Politics, ecocolonialism, and the politics of calculation in Boundary Water.” Michigan Technological University, Department of Social Sciences. Accepted in AREA (Journal of Royal Geographic Society). To be printed in early 2013. Available at <http://emmanorman.net/index_47_2773058474.pdf>.

criteria.¹¹ Under Executive Order 12898, the EPA must consider and address disproportionately high and adverse human health risk and effects on minority populations, including tribal nations and indigenous peoples, in its decision-making – which include the proposed approval of Michigan’s revised copper water quality standards. It should not be assumed that mercury will be addressed later on. Such current literature and critical insights that indicate the potential for adverse effects to our community should be meaningfully considered in light of EPA’s current decision-making on the proposed copper water quality criteria in Michigan.

Particular areas of cultural importance that would be impacted by the proposed changes include the Trap Rock site where the Community has undertaken restorative stocking efforts, particularly Brook and Lake Trout. Portage Lake, downstream from some of the proposed changes, is also a well-known very important fishing and spearing resource for our Community. In general, the community uses and is concerned with the health, restoration and conservation of all inland lakes and streams of Lake Superior and its fisheries.

Conclusion

The Community believes there will be adverse impacts to tribal interests in the waters where the proposed revised copper criteria will apply and is opposed to any unnecessary lowering of water quality standards at any of the sites, and thus asks that the EPA deny the proposed changes to the sites where Cu levels would increase.

It is hoped that awareness and attention is raised by review of recent studies cited in our comments, and that the EPA particularly review and consider the potential synergetic and ecosystem effects of elevated copper levels for some of the proposed water bodies in the Upper Peninsula.

If the changes are approved, it is requested that additional changes to other water bodies undergo a separate study specific to those water systems using appropriate and scientifically sound methodology. Also, if specific tribal resource harvest documentations arise, we ask that this information may be taken into account and allow for opportunities to amend specific site criteria as appropriate to protect tribal uses.

In the future, the Community wishes to be meaningfully consulted on a government-to-government basis early on, in addition to public comment periods, and seeks to coordinate with the EPA and the State further on this broader issue in order to improve current processes.

¹¹ O’neill, Catherine. 2008. “Environmental Justice in the Tribal Context: A Madness to EPA’s Method.”

In closing, the Community strongly recommends a precautionary approach in establishing water quality standards in order to ensure greater certainty and ample margin of safety for the health and well-being of our community now and into the future.

Attachment

2 December 2012

Comments on MDEQ plan to change surface water criterion for Copper to a site-specific value based on DOC

Noel R. Urban, Professor of Environmental Engineering, Michigan Technological University

First, I would like to commend the MDEQ for recognizing the inadequacy of the current state-wide, hardness-based surface water quality standard for copper. The current standard has little relationship to toxicity under field conditions. Nonetheless, there are three significant shortcomings to the current revision.

First, the plan is based on the assumption that DOC is the only water quality characteristic of significance for adjusting the aquatic life values for copper in Upper Peninsula streams and that modification of the aquatic life values would best be achieved by linear graphic interpolation of the WER from DOC concentrations. This assumption is not entirely correct. The 2007 MDEQ report detailing the evaluation of the WER and BLM approaches for the Upper Peninsula states "... there is no need to adjust copper criteria using the current convention of water hardness, or based on any other water quality characteristic, except possibly in the case of a very soft, acidic (pH < 7) ambient surface water." The 2007 study did not evaluate any soft, low-pH waters, but the caveat in that report is consistent with what is known about the effect of pH on copper speciation. Soft-water, low-pH streams are common in areas of the Upper Peninsula, and the existing procedure will not work in those streams.

Second, the recommended site specific FCV for copper is calculated by taking the old, hardness-based FCV and multiplying it by the site-specific WER as interpolated from the regional regression of WER and DOC. The logic of the procedure followed here eludes me. It is stated in the 2007 and 2012 documents on WER development that toxicity in UP surface waters showed no significant correlation with hardness. It would seem to follow from that observation that the current site-specific FCV values have little meaning. Why do they gain legitimacy by multiplying them by site-specific WER values? By adjusting the FCV with the site-specific WER, values are raised or lowered according to the abundance of DOC; however, there is no justification for using the current FCV values as the starting point for the adjustment. It would seem that a more logical approach would be to use the acute toxicity as measured in the lab multiplied by a Chronic to Acute Toxicity Ratio as the known FCV that can then be adjusted with site-specific WER values. This approach is illustrated in the equation below.

$$\text{Site-specific FCV} = \text{Laboratory AMV} \bullet \frac{\text{Chronic Toxicity}}{\text{Acute Toxicity}} * \frac{\text{Site-specific LC50}}{\text{Lab LC50}}$$

Of course, the approach above is equivalent to multiplying an interpolated site-specific LC50 by the Chronic to Acute Ratio.

Third, neither the EPA's recommended protocol nor the MDEQ's protocol requires an analysis of uncertainty. It would seem prudent for the state to either calculate uncertainties explicitly or

to adopt a margin of safety. At present, this margin of safety is assumed to be achieved by using the lowest measured DOC value to calculate the site-specific WER. However, there is no assurance that the lowest measured concentration is the lowest value that occurs. In large rivers such as those sampled in the MDEQ's 2007 report on WER development, DOC concentrations are generally proportional to flow; highest concentrations occur during snow melt and lowest concentrations during summer low flows. However, for small, wetland-dominated streams, maximum DOC concentrations occur during summer low flows and minimum concentrations occur during spring high flows. Because the MDEQ seldom samples during the period of high flow in spring, it is unlikely to measure the lowest DOC concentration that occurs in small streams.

Parameter	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS	ESR1MS
Date	11/8/2006	9/13/2007	8/28/2007	10/25/2007	3/12/2008	6/4/2008	9/2/2008	10/30/2008	6/4/2009	9/17/2009	12/2/2009	3/4/2010	6/10/2010	6/9/2011	8/25/2011	11/3/2011	5/10/2012	8/13/2012						
Copper	16	19	ND	33	25	28	13	15	19	16	18	13	17	24	10	14	24	9.4						